# Field Review of the Draft K-12 Grade Span Expectations (GSEs) in Engineering and Technology

#### **Please Note:**

Please return information and comments by mail or e-mail to:

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FAX: 401-222-6033
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NOTE: You may submit a compilation of district teachers' comments and/or individual comments by attachment electronically to Science and Technology Specialists

Peter McLaren at <a href="mailto:peter.mclaren@ride.ri.gov">peter.mclaren@ride.ri.gov</a>
or

Linda A. Jzyk at linda.jzyk@ride.ri.gov

Any questions regarding the Field Review process may be directed to:

Linda A. Jzyk (linda.jzyk@ride.ri.gov) at 222-8473 or Peter McLaren (peter.mclaren@ride.ri.gov) at 222-8454.

# Field Review of the Draft K-12 Grade Span Expectations (GSEs) in Engineering and Technology

#### **Directions:**

- 1) Begin the review process with the grade level(s) with which you are most familiar. There are three grade spans that will be used for local assessment (K-4, 5-8, & 9-12).
- 2) Complete the Reviewer Information form found on page 2.
- 3) Read "About the Draft Rhode Island K-12 Grade Span Expectations in Engineering and Technology" in the Appendix of this document to understand how the draft engineering and technology (E & T) GSEs were developed; the format of the document; and, the relationships between the Statements of Enduring Knowledge (EK), the local Assessment Targets, the cross-grade span Stems and the GSEs.
- 4) Read the following questions which form the basis for this field review document:
  - **Question 1**: Is the E & T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment?
  - **Question 2:** Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K high school.
  - **Question 3**: Is the E & T GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?
  - **Question 4:** Does the set of E & T GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these E & T GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved?
  - Question 5: What engineering and technology content and skills are missing in these draft E & T GSEs? Where are there gaps in content and skills? This information is most essential for developing E & T GSEs for local curriculum, instruction and assessment?
- 5) Locate the grade span you are reviewing in the draft E & T Engineering and Technology GSEs document. To help specify the E & T GSE on the review packet, the initial portion of the GSE as listed in the GSE document, has been written next to the GSE number in the review packet.
- 7) Work through questions 1, 2, and 3 for each E & T GSE within that grade span. Then answer questions 4 and 5 about the set of E & T GSEs within the Statements of Enduring Knowledge.

Notice there is a place to code a response to each question and a place to provide comments.

#### **Field Review**

# Draft Rhode Island K-12 Grade Span Expectations in Engineering and Technology Individual Reviewer Information

Name:
District/Organization:
School or Other:
Preferred Telephone Number:
E-mail Address:
Position:
Grade level and/or course(s) taught:
Number of years in that position:
Certification(s):
Name or description of engineering and technology program, curriculum and/ or textbook in use:
Participation on other district and statewide teams (e.g. Science GSE development team, district curriculum committee, school improvement team, peer review team)

#### Is the E &T GSE articulated in a way that it is clear what is expected of classroom

**instruction/curriculum and local assessment?** (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

ET1.2 (3-4) Students demonstrate an understanding of the need for

2a. defining technology <u>as any process</u>

or invention that affects society 2b. discussing the purpose of 0

technology by:

technology...

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA - STL 1-7)

(IIEA – SIL I-7)			
<b>Local Assessment Target</b>			Comments
ET1.1 (K-4)			
Demonstrate and identify red	v		
development of technology a	nd its effects	on	
humankind.			
E & T GSE	Curriculum/	Local	
ET1.1 (K-2) Students demonstrate an understanding of the nature of technology by:	Instruction	Assessment	
1a. investigating life without current technology	0	0	
1b. describing how technology affects	0	0	
1c. differentiating between needs/wants, helpful/ harmful	0	0	
ET1.1 (3-4) Students demonstrate an understanding of the nature of technology by:			
1a. comparing and contrasting life with and without current technology	0	0	
1b. recognizing that technology has positive and negative	0	0	
1c. identifying natural vs. human-made objects	0	0	
<b>Local Assessment Target</b>			Comments
ET1.2 (K-4)			
Discuss and define technolog	gy and its rela	itionship to	
the natural and designed (hu	ıman-made) w	orld in the	
local community.			
E & T GSE	Curriculum/	Local	
ET1.2 (K-2) Students demonstrate an understanding of the need for technology by:	Instruction	Assessment	
2a. defining technology as something that makes life easier	0	0	
2b. discussing the purpose of technology	0	0	

0

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

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<b>Local Assessment Target</b>			Comments
ET2.1 (K-4)			
Explore and recognize the a	ttributes of the	e design	
process.			
E & T GSE	Curriculum/	Local	
ET2.1 (K-2) Students demonstrate an	Instruction	Assessment	
understanding of the attributes of the design process by:			
1a. asking questions, making	0	0	
observations 1b. exploring solutions to a problem	0	0	
1c. completing tasks cooperatively	0	0	
ET2.1 (3-4) Students demonstrate an understanding of the attributes of the			
design process by:			
1a. defining a problem and expressing	0	0	
1b. solving problems through the creation of design	0	0	
1c. identifying the characteristics of	0	0	
being an effective team			
<b>Local Assessment Target</b>			Comments
ET2.2 (K-4)			
Explore and recognize basic	technologica	l products	
and systems, as well as their	tools.		
E & T GSE	Curriculum/	Local	
ET2.2 (K-2) Students demonstrate an	Instruction	Assessment	
understanding of technological products and systems by:			
2a. identifying and safely using	0	0	
2b. collecting and using information	0	0	
2c. exploring how things work	0	0	
2d. exploring the properties			
ET2.2 (3-4) Students demonstrate an	0	0	
understanding of tehnological			
products and systems by:	0	0	
2a. identifying and safely using	Ŭ		
2b. <u>using information to identify</u> <u>patterns</u>	0	0	
2c. following step by step procedures	U		
2d. <u>identifying the effects of technology</u>	0	0	

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

Local Assessment Target		
ET2.3 (K-4)		
Explore the processes of res		-
invention and innovation, ex	perimentation	ı, and
troubleshooting in planning	practical soli	ıtions to
problems.		
E & T GSE	Curriculum/	Local
	Instruction	Assessment
ET2.3 (K-2) Students demonstrate an understanding of effective design		
by:		
3a. recognizing there are steps to solving	0	0
a problem		
3b. experimenting / exploring with	0	0
various materials		
3c. asking questions and making observations	0	0
******	_	
3d. comparing and contrasting various design	0	0
ET2.3 (3-4) Students demonstrate an		
understanding of effective design by:		
3a. exploring the process of solving	0	0
3b. using age-appropriate construction		
materials to build	0	0
3c. testing, troubleshooting, and	0	0
evaluating	0	0
3d. <u>documenting the advantages and</u> disadvantages		

#### Is the E &T GSE articulated in a way that it is clear what is expected of classroom

**instruction/curriculum and local assessment?** (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

<b>Local Assessment Target</b>			Comments
ET3.1 (K-4)			
Recognize that there are var	ious areas in		
engineering and technology.			
E & T GSE	Curriculum/	Local	
ET3.1 (K-2) Students demonstrate an understanding of the areas of engineering and technology by:	Instruction	Assessment	
1a. identifying community workers in these areas.	0	0	
1b. making connections between these different areas	0	0	
ET3.1 (3-4) Students demonstrate an understanding of the areas of engineering and technology by:			
1a. <u>identifying responsibilities of</u> community workers	0	0	
1b. specifying and explaining the connections	0	0	
<b>Local Assessment Target</b>			Comments
Local Assessment Target ET3.2 (K-4)			Comments
	te tools to med	isure,	Comments
ET3.2 (K-4)	fic technologi		Comments
ET3.2 (K-4) Select and utilize appropriate design, and implement specific & T GSE	fic technologi Curriculum/	es. Local	Comments
ET3.2 (K-4) Select and utilize appropriate design, and implement speci	fic technologi	es.	Comments
ET3.2 (K-4) Select and utilize appropriate design, and implement specific E & T GSE ET3.2 (K-2) Students demonstrate an understanding of selecting	fic technologi Curriculum/	es. Local	Comments
ET3.2 (K-4)  Select and utilize appropriate design, and implement specific E & T GSE  ET3.2 (K-2) Students demonstrate an understanding of selecting appropriate tools by:  2a. recognizing that there are specialized	fic technologi Curriculum/ Instruction	es. Local Assessment	Comments
ET3.2 (K-4)  Select and utilize appropriate design, and implement specifications and implement specifications.  E & T GSE  ET3.2 (K-2) Students demonstrate an understanding of selecting appropriate tools by:  2a. recognizing that there are specialized tools  2b. experimenting with different tools for tasks  ET3.2 (3-4) Students demonstrate an understanding of selecting	fic technologi Curriculum/ Instruction	Local Assessment	Comments
ET3.2 (K-4)  Select and utilize appropriate design, and implement specification of the specific design, and implement specification of the specific design appropriate tools by:  2a. recognizing that there are specialized tools  2b. experimenting with different tools for tasks  ET3.2 (3-4) Students demonstrate an understanding of selecting appropriate tools by:	fic technologi Curriculum/ Instruction	Local Assessment	Comments
ET3.2 (K-4)  Select and utilize appropriate design, and implement specifications and implement specifications.  E & T GSE  ET3.2 (K-2) Students demonstrate an understanding of selecting appropriate tools by:  2a. recognizing that there are specialized tools  2b. experimenting with different tools for tasks  ET3.2 (3-4) Students demonstrate an understanding of selecting	fic technologi Curriculum/ Instruction	Local Assessment	Comments

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA – STL 1-7)

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<b>Local Assessment Target</b>			Comments
ET1.1 (K-4)			
Demonstrate and identify rea	asons for the		
development of technology a	and its effects	on	
humankind.			
E & T GSE	Differences	Differences	
ET1.1 (K-2) Students demonstrate an understanding of the nature of technology by:	Clear	Not Clear	
1a. investigating life without current technology	0	0	
1b. describing how technology affects		0	
1c. differentiating between needs/wants, helpful/ harmful	0	0	
ET1.1 (3-4) Students demonstrate an understanding of the nature of technology by:			
1a. comparing and contrasting life with and without current technology	0	0	
1b. recognizing that technology has positive and negative	0	0	
1c. identifying natural vs. human-made	0	0	
objects			
<b>Local Assessment Target</b>			Comments
ET1.2 (K-4)			
Discuss and define technolog	J.	*	
the natural and designed (hi	ıman-made) v	vorld in the	
local community.			
E & T GSE	Differences	Differences	
ET1.2 (K-2) Students demonstrate an understanding of the need for	Clear	Not Clear	
technology by:			
2a. defining technology as something that makes life easier	0	0	
2b. discussing the purpose of technology	0	0	
ET1.2 (3-4) Students demonstrate an understanding of the need for technology by:			
2a. defining technology <u>as any process</u> or invention that affects society	0	0	
2b. discussing the purpose of	0	0	

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA – STL 1-7)

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Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>		
ET2.3 (K-4)		
Explore the processes of res	earch and de	velopment,
invention and innovation, ex	perimentatio	n, and
troubleshooting in planning	•	
problems.	<i>F</i> • • • • • • • • • • • • • • • • • • •	
E & T GSE	Differences	Differences
ET2.3 (K-2) Students demonstrate	Clear	Not Clear
an understanding of effective design		
by:		
3a. recognizing there are steps to solving a problem	0	0
3b. experimenting / exploring with various materials	0	0
3c. asking questions and making observations	0	0
3d. comparing and contrasting various design	0	0
ET2.3 (3-4) Students demonstrate an understanding of effective design by:		
3a. exploring the process of solving	0	0
3b. using age-appropriate construction	Ŭ	
materials to build	0	0
3c. testing, troubleshooting, and evaluating	0	0
3d. <u>documenting the advantages and disadvantages</u>	0	0

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

information and communica	tion, transpor	tation, manu	facturing, and construction
<b>Local Assessment Target</b>			Comments
ET3.1 (K-4)			
Recognize that there are var			
engineering and technology.		1	
E & T GSE	Differences Clear	Differences Not Clear	
ET3.1 (K-2) Students demonstrate an understanding of the areas of engineering and technology by:	Clear	Not Clear	
1a. identifying community workers in these areas.	0	0	
1b. making connections between these different areas	0	0	
ET3.1 (3-4) Students demonstrate an understanding of the areas of engineering and technology by:			
1a. <u>identifying responsibilities of</u> community workers	0	0	
1b. <u>specifying and explaining the</u> connections	0	0	
<b>Local Assessment Target</b>			Comments
ET3.2 (K-4)			
Select and utilize appropriat			
design, and implement speci	fic technologi	es.	
E & T GSE	Differences Clear	Differences Not Clear	
ET3.2 (K-2) Students demonstrate an understanding of selecting appropriate tools by:			
2a. recognizing that there are specialized	0	0	
tools  2b. experimenting with different tools for tasks	0	0	
ET3.2 (3-4) Students demonstrate an understanding of selecting appropriate tools by:	_		
2a. identifying characteristics of appropriate	0	0	
2b. experimenting <u>and selecting the optimal</u> tool	0	0	

Question 3: Expected Rigor Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your							
school's engineering and technology content and skills at that grade span?							
Statement of Enduring Kn	owledge						
	_	ov imr	acts the	e world and the growth of humankind			
(ITEA – STL 1-7)	Cillion	ogy mip	acts the	world and the growth of humanking			
Local Assessment Target				Comments			
ET1.1 (K-4)				Comments			
Demonstrate and identify red	asons for	the					
development of technology a	•						
humankind.	na us cjj	ccis on					
E & T GSE	More	As	Less				
ET1.1 (K-2) Students demonstrate an	Rigorous	Rigorous	Rigorous				
understanding of the nature of technology by:							
1a. investigating life without current technology	0	0	0				
1b. describing how technology affects	0	0	0				
1c. differentiating between needs/wants, helpful/ harmful	0	0	0				
ET1.1 (3-4) Students demonstrate an understanding of the nature of technology by:							
1a. comparing and contrasting life with and without current technology	0	0	0				
1b. recognizing that technology has positive and negative	0	0	0				
1c. identifying natural vs. human-made objects	0	0	0				
<b>Local Assessment Target</b>				Comments			
ET1.2 (K-4)							
Discuss and define technolog	gy and its	s relation	iship to				
the natural and designed (human-made) world in the							
local community.							
E & T GSE ET1.2 (K-2) Students demonstrate an understanding of the need for technology by:	More Rigorous	As Rigorous	Less Rigorous				
2a. defining technology as something that makes life easier	0	0	0				
2b. discussing the purpose of technology	0	0	0				
ET1.2 (3-4) Students demonstrate an understanding of the need for technology by:							

2a. defining technology <u>as any process</u> <u>or invention that affects society</u>

2b. discussing the purpose of technology...

process.

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

Local Assessment Target	Comments
ET2.1 (K-4)	
Explore and recognize the attributes of the design	

r			
E & T GSE ET2.1 (K-2) Students demonstrate an understanding of the attributes of the design process by:	More Rigorous	As Rigorous	Less Rigorous
1a. asking questions, making	0	0	0
observations 1b. exploring solutions to a problem	0	0	0
1c. completing tasks cooperatively	0	0	0
ET2.1 (3-4) Students demonstrate an understanding of the attributes of the design process by:			
1a. defining a problem and expressing	0	0	0
1b. solving problems through the creation of design	0	0	0
1c. identifying the characteristics of being an effective team	0	0	0

# Local Assessment Target ET2.2 (K-4)

Explore and recognize basic technological products and systems, as well as their tools.

E & T GSE	More Rigorous	As Rigorous	Less Rigorous
ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:	<u> </u>	Ü	Ü
products and systems by:	0	0	0
2a. identifying and safely using	0	0	0
2b. collecting and using information			
2c. exploring how things work	0	0	0
2d exploring the properties	0	0	0
ET2.2 (3-4) Students demonstrate an understanding of tehnological products and systems by:			
2a. identifying and safely using	0	0	0
2b. <u>using information to identify</u> <u>patterns</u>	0	0	0
2c. following step by step procedures	0	0	0
2d. <u>identifying the effects of technology</u>	0	0	0

#### **Comments**

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

**Comments** 

# **Local Assessment Target ET2.3** (K-4)

Explore the processes of research and development, invention and innovation, experimentation, and troubleshooting in planning practical solutions to problems

problems.	problems.		
E & T GSE	More Rigorous	As Rigorous	Less Rigorous
ET2.3 (K-2) Students demonstrate an understanding of effective design			
by:			
3a. recognizing there are steps to solving a problem	0	0	0
3b. experimenting / exploring with various materials	0	0	0
3c. asking questions and making observations	0	0	0
3d. comparing and contrasting various design	0	0	0
ET2.3 (3-4) Students demonstrate an understanding of effective design by:			
3a. exploring the process of solving	0	0	0
3b. using age-appropriate construction materials to build	0	0	0
3c. testing, troubleshooting, and evaluating	0	0	0
3d. <u>documenting the advantages and disadvantages</u> .	0	0	0

Question 3: Expected Rigo Is the GSE more rigorous, school's engineering and te	similar t	,	_	us than what is presently expected in your ills at that grade span?
Statement of Enduring Kn	owledge			
ET1 - Engineering and	technolo	ogy imp	pacts the	world and the growth of humankind
(ITEA – STL 1-7)				_
<b>Local Assessment Target</b>				Comments
ET3.1 (K-4)				
Recognize that there are var	ious arec	ıs in		
engineering and technology.				
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET3.1 (K-2) Students demonstrate an understanding of the areas of	Rigor ous	Nigor ous	Nigor ous	
engineering and technology by:				
1a. identifying community workers in these areas.	0	0	0	
1b. making connections between these different areas	0	0	0	
ET3.1 (3-4) Students demonstrate an understanding of the areas of engineering and technology by:				
1a. <u>identifying responsibilities of</u> community workers	0	0	0	
1b. specifying and explaining the connections	0	0	0	
Local Assessment Target ET3.2 (K-4) Select and utilize appropriat	te tools to	) measur	e,	Comments
design, and implement speci	fic techno	ologies.		
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET3.2 (K-2) Students demonstrate an understanding of selecting appropriate tools by:		Ü		
2a. recognizing that there are specialized tools	0	0	0	
2b. experimenting with different tools for tasks	0	0	0	
ET3.2 (3-4) Students demonstrate an understanding of selecting appropriate tools by:				

2a. identifying characteristics of appropriate ...

2b. experimenting and selecting the optimal tool...

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o No o

Statement of Enduring Kr	owledge		
ET1 - Engineering and	technology	impacts th	e world and the growth of
humankind (ITEA – ST	L 1-7)	_	
<b>Local Assessment Target</b>			Comments
ET1.1 (K-4)			
Demonstrate and identify re	easons for the	e develop-	
ment of technology and its e	• •		
E & T GSE	Individual coher Statement of En		
ET1.1 (K-2) Students demonstrate	Knowledge	g	
an understanding of the nature of technology by:	yes	no	
1a. investigating life without current technology	0	0	
1b. describing how technology affects	0	0	
1c. differentiating between needs/wants, helpful/ harmful	O	0	
ET1.1 (3-4) Students demonstrate an understanding of the nature of technology by:			
1a. comparing and contrasting life with and without current technology	0	0	
1b. recognizing that technology has positive and negative	0	0	
1c. <u>identifying natural vs. human-made</u> <u>objects</u>	0	0	
<b>Local Assessment Target</b>			Comments
ET1.2 (K-4)			
Discuss and define technolo	gy and its re	lationship	
to the natural and designed	(human-mad	le) world in	
the local community.			
E & T GSE ET1.2 (K-2) Students demonstrate	Individual coher Statement of En- Knowledge		
an understanding of the need for technology by:	yes	no	
2a. defining technology as something that makes life easier	0	0	
2b. discussing the purpose of technology	0	0	
ET1.2 (3-4) Students demonstrate an understanding of the need for technology by:			
2a. defining technology <u>as any process</u> or invention that affects society	0	0	
2b. discussing the purpose of technology	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

#### **Statement of Enduring Knowledge**

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA - STL 1-7)

(ITEA – STL 1-7)			
<b>Local Assessment Target</b>			Comments
ET2.1 (K-4)			
Explore and recognize the attr	ributes of the	design	
process.	v	O	
E & T GSE	Individual coher Statement of En Knowledge		
ET2.1 (K-2) Students demonstrate an understanding of the attributes of the design process by:	yes	no	
1a. asking questions, making	0	0	
observations 1b. exploring solutions to a problem	0	0	
1c. completing tasks cooperatively	0	0	
ET2.1 (3-4) Students demonstrate an understanding of the attributes of the design process by:			
1a. <u>defining a problem and expressing</u>	0	0	
1b. solving problems through the creation of design	0	0	
1c. identifying the characteristics of being an effective team	0	0	
Local Assessment Target			Comments
ET2.2 (K-4)	. 1 1		Comments
ET2.2 (K-4) Explore and recognize basic to	_	products	Comments
ET2.2 (K-4) Explore and recognize basic to and systems, as well as their to	ools.		Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE	ools. Individual coher	rence within the	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an	ools. Individual coher Statement of En Knowledge	rence within the during	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE	ools. Individual coher	rence within the	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products	ools. Individual coher Statement of En Knowledge	rence within the during	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:	Individual coher Statement of En Knowledge	rence within the during	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using	ools. Individual coher Statement of En Knowledge  yes	no  o	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using  2b. collecting and using information	ools. Individual coher Statement of En Knowledge  yes	rence within the during  no	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using  2b. collecting and using information  2c. exploring how things work	ools. Individual coher Statement of En Knowledge  yes	no  o	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using  2b. collecting and using information  2c. exploring how things work  2d. exploring the properties  ET2.2 (3-4) Students demonstrate an understanding of tehnological products	ools. Individual coher Statement of En Knowledge  yes	no  no  no	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using  2b. collecting and using information  2c. exploring how things work  2d. exploring the properties  ET2.2 (3-4) Students demonstrate an understanding of tehnological products and systems by:  2a. identifying and safely using	ools. Individual coher Statement of En Knowledge  yes	no  o o o	Comments
ET2.2 (K-4)  Explore and recognize basic to and systems, as well as their to E & T GSE  ET2.2 (K-2) Students demonstrate an understanding of technological products and systems by:  2a. identifying and safely using  2b. collecting and using information  2c. exploring how things work  2d. exploring the properties  ET2.2 (3-4) Students demonstrate an understanding of tehnological products and systems by:	ools. Individual coher Statement of En Knowledge  yes	no  no  no	Comments

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

#### **Statement of Enduring Knowledge**

Local Assessment Target			Comments
ET2.3 (K-4)			
Explore the processes of res	search and d	evelopment,	
invention and innovation, ex	xperimentatio	on, and	
troubleshooting in planning	practical so	lutions to	
problems.	•		
E & T GSE ET2.3 (K-2) Students demonstrate	Individual coher Statement of En Knowledge		
an understanding of effective design	yes	no	
by:			
3a. recognizing there are steps to solving a problem	0	0	
3b. experimenting / exploring with various materials	0	0	
3c. asking questions and making observations	0	0	
3d. comparing and contrasting various design	0	0	
ET2.3 (3-4) Students demonstrate an understanding of effective design by:			
3a. exploring the process of solving	0	0	
3b. using age-appropriate construction materials to build	0	0	
3c. testing, troubleshooting, and	0	0	
evaluating  3d. documenting the advantages and disadvantages	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

#### **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

injormation and communice	illori, iranspe	manion, man	ajaciaring, and construction
ET3.1 (K-4)			Comments
Recognize that there are val		n	
engineering and technology			
E & T GSE	Individual coher Statement of En		
ET3.1 (K-2) Students demonstrate	Knowledge	dui ing	
an understanding of the areas of engineering and technology by:	yes	no	
1a. identifying community workers in these areas.	0	0	
1b. making connections between these different areas	0	0	
ET3.1 (3-4) Students demonstrate an understanding of the areas of engineering and technology by:		0	
1a. <u>identifying responsibilities of</u> community workers	0	0	
1b. specifying and explaining the connections	0	0	
<b>Local Assessment Target</b>			Comments
ET3.2 (K-4)			5 5
Select and utilize appropria	te tools to m	easure.	
design, and implement spec			
E & T GSE	Individual coher	rence within the	
ET3.2 (K-2) Students demonstrate	Knowledge		
an understanding of selecting appropriate tools by:	yes	no	
2a. recognizing that there are specialized tools	0	0	
2b. experimenting with different tools for tasks	0	0	
ET3.2 (3-4) Students demonstrate an understanding of selecting appropriate tools by:			
2a. identifying characteristics of appropriate	0	0	
2b. experimenting and selecting the optimal tool	0	0	

draft E & T GSEs? WI	ineering and technology content and skills are missing in these here are there gaps in content and skills? This information is loping E & T GSEs for local curriculum, instruction and
Relevant EK and GSEs	Content/Concepts/Skills that need to be included (Please provide as much detail as possible)
(Identify by EK and GSE number - ex. E&T 1, 1a)	

#### Is the E &T GSE articulated in a way that it is clear what is expected of classroom

instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA - STL 1-7)

<b>Local Assessment Target</b>			Comments
ET1.1 (5-8)			
Compare, contrast, and prov	vide evidence	of how	
technology influences histor	y and impacts	society.	
E & T GSE	Curriculum/	Local	
ET1.1 (5-6) Students demonstrate an understanding of the impact of	Instruction	Assessment	
technology by:			
1a. researching and displaying how historical events	0	0	
1b. listing and describing the importance of technology in daily life.	0	0	
1c. evaluating the many and varying uses of technology	0	0	
ET1.1 (7-8) Students demonstrate an understanding of the impact of technology by:			
1a. <u>describing how technological</u> <u>advances affect society</u>	0	0	
1b. comparing and contrasting the social and economic concerns	0	0	
1c. <u>analyzing</u> the use of technology within <u>various cultures</u>	0	0	
Local Assessment Target			Comments
ET1.2 (5-8)	<i>CC</i>		
Describe and demonstrate th		1	
technological systems to hun	nankind on a i	national	

# scale.

E & T GSE	Curriculum/ Instruction	Local Assessment
ET1.2 (5-6) Students demonstrate an understanding of the outcomes of technology by:	Instruction	Assessment
2a. making connections between technological inventions	0	0
2b. researching and analyzing the effects on humankind and the environment		Č
ET1.2 (7-8) Students demonstrate an understanding of the outcomes of technology by:		
2a. designing or improving a technological product and	0	0
2b. associating and illustrating the effects of particular technological s	0	0

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

**Local Assessment Target** 

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

**Comments** 

ET2.1 (5-8)			
Utilize the attributes of the a	design process	to solve a	
real world problem.			
E & T GSE ET2.1 (5-6) Students demonstrate an understanding of the attributes of the	Curriculum/ Instruction	Local Assessment	
design process by:			
1a. defining a problem <u>that addresses a scenario</u>	0	0	
1b. selecting an appropriate design solution for a given scenario or task.	0	0	
1c. <u>explaining</u> what makes an effective design	0	0	
ET2.1 (7-8) Students demonstrate an understanding of the attributes of the design process by:			
1a. defining a problem that addresses a scenario	0	0	
1b. selecting <u>and justifying</u> an appropriate design solution	0	0	
1c. fulfilling a specific function as a team member	0	0	
<b>Local Assessment Target</b>	-		Comment

### **Local Assessment Target** ET2.2 (5-8)

Use and maintain technological products and systems, as well as their tools.

E & T GSE	Curriculum/	Local
ET2.2 (5-6) Students demonstrate an	Instruction	Assessment
understanding of technological products and systems by:		
2a. safely using the required tools	0	0
2b. <u>incorporating assigned materials</u>	0	0
2c. <u>using information to discover,</u> <u>diagnose and troubleshoot</u>	0	0
2d. interpreting and evaluating the	0	0
ET2.2 (7-8) Students demonstrate an understanding of technological		
products and systems by:	0	0
2a. explaining and safely using the		
required tools	0	0
2b. incorporating <u>information</u> , <u>proper material selection</u>	0	0
2c. using tools to diagnose, adjust,	0	0
2d. interpreting and evaluating the		

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

#### **Statement of Enduring Knowledge**

simile, and creativity. (11	2110120	10)		
<b>Local Assessment Target</b>			Co	mments
ET2.3 (5-8)				
Utilize processes (i.e. resear	ch and develo	pment,		
invention and innovation, ex	perimentation	ı, and		
troubleshooting) in designs i	that use criter	ia and		
constraints leading to useful	products and	systems.		
E & T GSE	Curriculum/	Local		
ET2.3 (5-6)	Instruction	Assessment		
Students demonstrate an understanding of effective designs of products and systems by:				
3a. <u>formulating</u> a process to solve a real world problem.	0	0		
b. utilizing materials <u>provided to</u> onstruct a working model	0	0		
Bc. testing, troubleshooting, and	0	0		
valuating an <u>intermediate</u> design	0	0		
d. presenting their final working model or peer review and revision.	0	0		
ET2.3 (7-8) Students demonstrate an inderstanding of effective designs of products and systems:				
Ba. formulating a process to solve	0	0		
b. utilizing materials provided to onstruct a working model	0	0		
c. testing, troubleshooting, and valuating a <u>complex</u> design solution.	0	0		
3d. presenting their documentation, revisions, and final working model	0	0		
			ĺ	

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

			<b>~</b>
Local Assessment Target			Comments
ET3.1 (5-8)			
Explore the various areas in		and	
technology and their interco	-		
E & T GSE	Curriculum/	Local	
ET3.1 (5-6) Students demonstrate an understanding of the areas of engineering and technology by:	Instruction	Assessment	
1a. <u>differentiating among the various</u> engineering	0	0	
1b. researching the connections within these areas as they apply to	0	0	
ET3.1 (7-8) Students demonstrate an understanding of the areas of engineering and technology by:  1a. researching and defining the	0	0	
requirements of			
1b. <u>evaluating</u> the connections within these areas	0	0	
Local Assessment Target			Comments
ET3.2 (5-8)			Comments
Compare and contrast tools	to measure d	esion and	
implement specific technolog		esign, and	
E & T GSE	Curriculum/	Local	
ET3.2 (5-6) Students demonstrate an	Instruction	Assessment	
understanding of selecting appropriate tools by:			
2a. comparing and contrasting tools used for the same purpose across	0	0	
2b. <u>researching</u> and selecting the optimal tool for a given task	0	0	
ET3.2 (7-8) Students demonstrate an understanding of selecting appropriate tools by:			
	0	0	
2a. researching and explaining the evolution of key tool(s)		0	
	0	0	

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

2b. associating and illustrating the effects of particular technological ...

ET1 - Engineering and (ITEA – STL 1-7)	technology	impacts the	world and the growth of humankind
Local Assessment Target ET1.1 (5-8) Compare, contrast, and prov technology influences history		•	Comments
E & T GSE ET1.1 (5-6) Students demonstrate an understanding of the impact of technology by:	Differences Clear	Differences Not Clear	
1a. <u>researching and displaying how</u> historical events	0	0	
1b. listing and describing the importance of technology in daily life.	0	0	
1c. evaluating the many and varying uses of technology	0	0	
ET1.1 (7-8) Students demonstrate an understanding of the impact of technology by:			
1a. describing how technological advances affect society	0	0	
1b. comparing and contrasting the social and economic concerns	0	0	
1c. <u>analyzing</u> the use of technology within <u>various cultures</u>	O	0	
Local Assessment Target ET1.2 (5-8)			Comments
Describe and demonstrate th	00		
technological systems to hun scale.	nankina on a	панопаі	
E & T GSE ET1.2 (5-6) Students demonstrate an	Differences Clear	Differences Not Clear	
understanding of the outcomes of technology by:			
2a. <u>making connections between</u> technological inventions	0	0	
2b. researching and analyzing the effects on humankind and the environment	0	0	
ET1.2 (7-8) Students demonstrate an understanding of the outcomes of technology by:			
2a. designing or improving a technological product and	0	0	
teennological product and		0	

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

Local Assessment Target		Comments	
ET2.1 (5-8) Utilize the attributes of the a real world problem.	lesign process	s to solve a	
E & T GSE	Differences	Differences	
ET2.1 (5-6) Students demonstrate an understanding of the attributes of the design process by:	Clear	Not Clear	
1a. defining a problem that addresses a scenario	0	0	
1b. <u>selecting an appropriate design</u> solution for a given scenario or task.	0	0	
1c. explaining what makes an effective design	0	0	
ET2.1 (7-8) Students demonstrate an understanding of the attributes of the design process by:			
1a. defining a problem that addresses a scenario	0	0	
1b. selecting and justifying an	0	0	
appropriate design solution  1c. fulfilling a specific function as a team member	0	0	
<b>Local Assessment Target</b>			Comments

### Local Assessment Target ET2.2 (5-8)

Use and maintain technological products and systems, as well as their tools.

E & T GSE	Differences	Differences
ET2.2 (5-6) Students demonstrate an	Clear	Not Clear
understanding of technological products and systems by:		
2a. safely using the required tools	0	0
2b. incorporating assigned materials	0	0
2c. using information to discover, diagnose and troubleshoot	0	0
2d. interpreting and evaluating the	0	0
ET2.2 (7-8) Students demonstrate an understanding of technological products and systems by:		
2a. explaining and safely using the required tools	0	0
2b. incorporating <u>information</u> , <u>proper</u>	0	0
material selection	0	0
2c. using tools to diagnose, adjust, 2d. interpreting and evaluating the	0	0

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>		Comments	
ET2.3 (5-8)			
Utilize processes (i.e. resear	ch and develo	pment,	
invention and innovation, ex	perimentation	ı, and	
troubleshooting) in designs i	hat use criter	ia and	
constraints leading to useful		systems.	
E & T GSE	Differences	Differences	
ET2.3 (5-6) Students demonstrate an	Clear	Not Clear	
understanding of effective designs of products and systems by:			
3a. formulating a process to solve a real	0	0	
world problem.	0	0	
3b. utilizing materials <u>provided to</u> <u>construct a working model</u>	0	0	
3c. testing, troubleshooting, and evaluating an <u>intermediate</u> design	0	0	
3d. presenting their final working model for peer review and revision.			
ET2.3 (7-8) Students demonstrate an understanding of effective designs of products and systems:			
3a. formulating a process to solve	0	0	
3b. utilizing materials provided to construct a working model	0	0	
3c. testing, troubleshooting, and evaluating a <u>complex</u> design solution.	0	0	
3d. presenting their <u>documentation</u> , <u>revisions</u> , and final working model	0	0	

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

<b>Local Assessment Target</b>			Comments
ET3.1 (5-8)			
Explore the various areas in	engineering		
technology and their interco	nnections.		
E & T GSE	Differences	Differences	
ET3.1 (5-6) Students demonstrate an	Clear	Not Clear	
understanding of the areas of engineering and technology by:			
1a. differentiating among the various engineering	0	0	
1b. researching the connections within these areas as they apply to	0	0	
ET3.1 (7-8) Students demonstrate an understanding of the areas of engineering and technology by:			
1a. researching and defining the requirements of	0	0	
1b. <u>evaluating</u> the connections within these areas	0	0	
Local Assessment Target			Comments
Local Assessment Target ET3.2 (5-8)			Comments
ET3.2 (5-8)	to measure, a	lesign, and	Comments
_		lesign, and	Comments
ET3.2 (5-8) Compare and contrast tools		Differences	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technolog  E & T GSE  ET3.2 (5-6) Students demonstrate an	gies.		Comments
ET3.2 (5-8) Compare and contrast tools implement specific technolog E & T GSE	gies.  Differences	Differences	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technolog  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting	Differences Clear	Differences Not Clear	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technolog  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used	gies.  Differences Clear	Differences Not Clear	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technolog  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal	Differences Clear	Differences Not Clear	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting appropriate tools by:  2a. researching and explaining the	Differences Clear	Differences Not Clear	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technolog.  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting appropriate tools by:  2a. researching and explaining the evolution of key tool(s)	Differences Clear	Differences Not Clear	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting appropriate tools by:  2a. researching and explaining the	Differences Clear	Differences Not Clear	Comments

Is the GSE more rigorous, school's engineering and to		,		us than what is presently expected in your ills at that grade span?
Statement of Enduring Kn	owledge			
ET1 - Engineering and	technolo	ogy imr	oacts the	e world and the growth of humankind
(ITEA – STL 1-7)				C
Local Assessment Target				Comments
ET1.1 (5-8)				Comments
Compare, contrast, and prov	vide evide	ence of h	ow	
technology influences histor				
	More	As	Less	
E & T GSE ET1.1 (5-6) Students demonstrate an understanding of the impact of technology by:	Rigorous	Rigorous	Rigorous	
1a. researching and displaying how historical events	0	0	0	
1b. listing and describing the importance of technology in daily life.	0	0	0	
1c. evaluating the many and varying uses of technology	0			
ET1.1 (7-8) Students demonstrate an understanding of the impact of technology by:				
1a. describing how technological advances affect society	0	0	0	
1b. comparing and contrasting the social and economic concerns	0	0	0	
1c. <u>analyzing</u> the use of technology within <u>various cultures</u>	0	0	0	
Local Assessment Target ET1.2 (5-8) Describe and demonstrate th	ie effects	of		Comments
technological systems to hun	nankind (	on a nati	onal	
scale.				
E & T GSE ET1.2 (5-6) Students demonstrate an understanding of the outcomes of technology by:	More Rigorous	As Rigorous	Less Rigorous	
2a. making connections between technological inventions	0	0	0	
2b. researching and analyzing the effects on humankind and the environment	0	0	0	
ET1.2 (7-8) Students demonstrate an understanding of the outcomes of technology by:				
2a. <u>designing or improving a</u> <u>technological product and</u>	0	0	0	
2b. associating and illustrating the effects of particular technological	0	0	0	
			1	

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

#### Local Assessment Target ET2.1 (5-8)

Utilize the attributes of the design process to solve a real world problem

real world problem.	1					
E & T GSE	More Rigorous	As Rigorous	Less Rigorous			
ET2.1 (5-6) Students demonstrate an understanding of the attributes of the design process by:						
1a. defining a problem that addresses a scenario	0	0	0			
1b. selecting an appropriate design solution for a given scenario or task.	0	0	0			
1c. explaining what makes an effective design	0	0	0			
ET2.1 (7-8) Students demonstrate an understanding of the attributes of the design process by:						
1a. defining a problem that addresses a scenario	0	0	0			
1b. selecting <u>and justifying</u> an appropriate design solution	0	0	0			
1c. fulfilling a specific function as a team member	0	0	0			

#### Comments

# **Local Assessment Target** ET2.2 (5-8)

Use and maintain technological products and systems, as well as their tools.

E & T GSE ET2.2 (5-6) Students demonstrate an understanding of technological products and systems by:	More Rigorous	As Rigorous	Less Rigorous
2a. safely using the required tools	0	0	0
<ul><li>2b. <u>incorporating assigned materials</u></li><li>2c. <u>using information to discover</u>,</li></ul>	0	0	0
diagnose and troubleshoot	0	0	0
2d. interpreting and evaluating the	0	0	0
ET2.2 (7-8) Students demonstrate an understanding of technological products and systems by:	Ü	Ü	Ü
2a. <u>explaining and safely using the</u> required tools	0	0	0
2b. incorporating <u>information</u> , <u>proper</u> material selection	0	0	0
2c. using tools to diagnose, adjust,	0	0	0
2d. interpreting and evaluating the	0	0	0

#### **Comments**

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

#### **Local Assessment Target Comments** ET2.3 (5-8) *Utilize processes (i.e. research and development,* invention and innovation, experimentation, and troubleshooting) in designs that use criteria and constraints leading to useful products and systems. More E & T GSE Rigorous Rigorous Rigorous ET2.3 (5-6) Students demonstrate an understanding of effective designs of products and systems by: 3a. formulating a process to solve a real 0 0 0 world problem. 3b. utilizing materials provided to 0 0 0 construct a working model ... 0 0 0 3c. testing, troubleshooting, and evaluating an intermediate design ... 3d. presenting their final working model 0 0 0 for peer review and revision. ET2.3 (7-8) Students demonstrate an understanding of effective designs of products and systems: 3a. formulating a process to solve ... 0 0 0 3b. utilizing materials provided to 0 0 0 construct a working model.... 3c. testing, troubleshooting, and 0 0 0 evaluating a complex design solution. 3d. presenting their documentation, 0 0 0 revisions, and final working model...

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

#### **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

information and communica	non, mar	ισροπαιι	Tri, Trictitu	,,,
<b>Local Assessment Target</b>				Comments
ET3.1 (5-8)				
Explore the various areas in	_	_		
technology and their interco			T _	
E & T GSE ET3.1 (5-6) Students demonstrate an understanding of the areas of engineering and technology by:	More Rigorous	As Rigorous	Less Rigorous	
1a. differentiating among the various engineering	0	0	0	
1b. researching the connections within these areas as they apply to	0	0	0	
ET3.1 (7-8) Students demonstrate an understanding of the areas of engineering and technology by:				
1a. researching and defining the requirements of	0	0	0	
1b. <u>evaluating</u> the connections within these areas	0	0	0	
<b>Local Assessment Target</b>				Comments
ET3.2 (5-8)				Comments
ET3.2 (5-8) Compare and contrast tools		ıre, desig	n, and	Comments
ET3.2 (5-8) Compare and contrast tools implement specific technolog	gies.			Comments
ET3.2 (5-8) Compare and contrast tools		As Rigorous	Less Rigorous	Comments
ET3.2 (5-8)  Compare and contrast tools  implement specific technolog  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting	gies.	As	Less	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used	gies.  More Rigorous	As Rigorous	Less Rigorous	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal	More Rigorous	As Rigorous	Less Rigorous	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting	More Rigorous	As Rigorous	Less Rigorous	Comments
ET3.2 (5-8)  Compare and contrast tools implement specific technology  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting appropriate tools by:  2a. researching and explaining the	gies.  More Rigorous	As Rigorous	Less Rigorous	Comments

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

No o

#### **Statement of Enduring Knowledge**

Engineering and technology impacts the world and the growth of humankind

ET1 - Engineering and tec	chnology in	npacts the v	world and the growth of humankind
(ITEA – STL 1-7)			
<b>Local Assessment Target</b>			Comments
ET1.1 (5-8)			
Compare, contrast, and provide	e evidence of	<sup>f</sup> how	
technology influences history a	nd impacts s	ociety.	
E & T GSE ET1.1 (5-6) Students demonstrate an	Individual cohe the Statement of Knowledge		
understanding of the impact of technology by:	yes	no	
1a. researching and displaying how historical events	0	0	
1b. listing and describing the importance of technology in daily life.	0	0	
1c. evaluating the many and varying uses of technology	0	0	
ET1.1 (7-8) Students demonstrate an understanding of the impact of technology by:			
1a. describing how technological advances	0	0	
1b. comparing and contrasting the social and economic concerns	0	0	
1c. <u>analyzing</u> the use of technology within <u>various cultures</u>	0	0	
<b>Local Assessment Target</b>			Comments
ET1.2 (5-8)			
Describe and demonstrate the o	effects of tech	hno-logical	
systems to humankind on a nati	ional scale.		
E & T GSE ET1.2 (5-6) Students demonstrate an	Individual coher Statement of En Knowledge		
understanding of the outcomes of technology by:	yes	no	
2a. <u>making connections between</u> <u>technological inventions</u>	0	0	
2b. researching and analyzing the effects on humankind and the environment	0	0	
ET1.2 (7-8) Students demonstrate an understanding of the outcomes of technology by:			
2a. <u>designing or improving a technological</u> <u>product and</u>	0	0	
2b. associating and illustrating the effects of particular technological	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o No o

#### **Statement of Enduring Knowledge**

ET2 - Effective design through engineering and technology is the outcome of a problem solving process involving the application of content knowledge, acquired skills, and creativity. (ITEA STL 8-13)

#### **Local Assessment Target Comments** ET2.1 (5-8) Utilize the attributes of the design process to solve a real world problem. Individual coherence within the E & T GSE Statement of Enduring ET2.1 (5-6) Students demonstrate an Knowledge understanding of the attributes of the yes no design process by: 1a. defining a problem that addresses a 0 0 scenario .... 0 1b. selecting an appropriate design solution for a given scenario or task. 0 0 1c. explaining what makes an effective design... 0 0 ET2.1 (7-8) Students demonstrate an understanding of the attributes of the design process by: 0 0 1a. defining a problem that addresses a scenario ... 0 1b. selecting and justifying an appropriate design solution ... 1c. fulfilling a specific function as a team 0 0 member ... **Comments**

## **Local Assessment Target** ET2.2 (5-8)

Use and maintain technological products and systems, as well as their tools.

E & T GSE ET2.2 (5-6) Students demonstrate an	Individual coherence within the Statement of Enduring Knowledge	
nderstanding of technological products and systems by:	yes	no
2a. safely using the required tools	0	0
<ul><li>2b. <u>incorporating assigned materials</u></li><li>2c. using information to discover, diagnose</li></ul>	0	0
and troubleshoot	0	0
2d. interpreting and evaluating the	0	0
ET2.2 (7-8) Students demonstrate an understanding of technological products and systems by:		
2a. <u>explaining and safely using the required</u> tools	0	0
2b. incorporating <u>information</u> , <u>proper material selection</u>	0	0
2c. using tools to diagnose, adjust,	0	0
2d. interpreting and evaluating the	0	0

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

#### **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>			Comments
ET2.3 (5-8)			
Utilize processes (i.e. research and development,			
invention and innovation, experimentation, and			
troubleshooting) in designs that use criteria and constraints leading to useful products and systems.			
T. & T GSE  T. 2.3 (5-6) Students demonstrate  Individual coherence within the Statement of Enduring Knowledge			
an understanding of effective designs of products and systems by:	yes	no	
3a. <u>formulating</u> a process to solve a real world problem.	0	0	
3b. utilizing materials <u>provided to</u> <u>construct a working model</u>	0	0	
3c. testing, troubleshooting, and evaluating an <u>intermediate</u> design	0	0	
3d. presenting their final working model for peer review and revision.	0	0	
ET2.3 (7-8) Students demonstrate an understanding of effective designs of products and systems:			
3a. formulating a process to solve	0	0	
3b. utilizing materials provided to construct a working model	0	0	
3c. testing, troubleshooting, and evaluating a <u>complex</u> design solution.	0	0	
3d. presenting their <u>documentation</u> , <u>revisions</u> , and final working model	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes O

No o

#### **Statement of Enduring Knowledge**

 $ET3\,$  - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

information and communice	iiion, iranspe	riaiion, man	ujaciaring, and construction
Local Assessment Target			Comments
ET3.1 (5-8)			
Explore the various areas in		g and	
technology and their interce			
E & T GSE ET3.1 (5-6) Students demonstrate an	Students demonstrate an G of the areas of		
understanding of the areas of engineering and technology by:	yes	no	
1a. differentiating among the various engineering	0	0	
1b. <u>researching the connections within</u> <u>these areas as they apply to</u>	0	0	
ET3.1 (7-8) Students demonstrate an understanding of the areas of engineering and technology by:			
1a. researching and defining the requirements of	0	0	
1b. evaluating the connections within these areas	0	0	
<b>Local Assessment Target</b>			
Local Assessment Target			Comments
ET3.2 (5-8)			Comments
S	to measure,	design,	Comments
ET3.2 (5-8)	nologies.		Comments
ET3.2 (5-8)  Compare and contrast tools and implement specific tech  E & T GSE  ET3.2 (5-6) Students demonstrate an		rence within the	Comments
ET3.2 (5-8) Compare and contrast tools and implement specific tech	nologies. Individual coher	rence within the	Comments
ET3.2 (5-8)  Compare and contrast tools and implement specific tech  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting	nologies. Individual coher Statement of En Knowledge	rence within the during	Comments
ET3.2 (5-8)  Compare and contrast tools and implement specific tech  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools	nologies. Individual coher Statement of En Knowledge yes	rence within the during	Comments
ET3.2 (5-8)  Compare and contrast tools and implement specific tech  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the	Individual coher Statement of En Knowledge  yes	rence within the during no	Comments
ET3.2 (5-8)  Compare and contrast tools and implement specific tech  E & T GSE  ET3.2 (5-6) Students demonstrate an understanding of selecting appropriate tools by:  2a. comparing and contrasting tools used for the same purpose across  2b. researching and selecting the optimal tool for a given task  ET3.2 (7-8) Students demonstrate an understanding of selecting	Individual coher Statement of En Knowledge  yes	rence within the during no	Comments

Question #5: What engineering and technology content and skills are missing in these draft E & T GSEs? Where are there gaps in content and skills? This information is most essential for developing E & T GSEs for local curriculum, instruction and assessment.							
Relevant EK and GSEs (Identify by EK and GSE number - ex. E&T 1, 1a)	Content/Concepts/Skills that need to be included (Please provide as much detail as possible)						

instruction/curriculum and	ed in a way the docal assession instruction/	ment? (Do I o	r what is expected of classroom understand the expectations of student learning to d assessment? If not, what aspect of the GSE xamples, etc.)
Statement of Enduring Kn	owledge		
	_	impacts the	world and the growth of humankind
(ITEA – STL 1-7)		Р	6 · · · · · · · · · · · · · · · · · · ·
Local Assessment Target			Comments
ET1.1 (9-12)			Comments
Identify the factors affecting	tachnologica	l advances	
		i aavances	
(e.g. social, economic, politi			
environmental) throughout l	Curriculum/	Local	
E & T GSE	Instruction	Local Assessment	
ET1.1 (9-12) Students demonstrate	That detion	ASSESSMENT	
an understanding of the influences of technology by:			
1a. analyzing factors related to the	0	0	
<u>development</u>			
1b. <u>assessing the relationship between</u> <u>available resources</u>	0	0	
1c. analyzing the evolution of factors	0	0	
affecting technological advances			
<b>Local Assessment Target</b>	•	•	Comments
ET1.2 (9-12)			
Analyze and explain advanc	ements in tech	nological	
systems and their impact on	the world.		
E & T GSE	Curriculum/	Local	
ET1.2 (9-12) Students demonstrate	Instruction	Assessment	
an understanding of the impacts of technology by:			
2a. revising a current technological system and analyzing the global	0	0	
	0	0	

0

2b. modeling and evaluating the design of a technological system ...

### **Question 1: Clarity of E &T GSE**

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do Lunderstand the expectations of student

**instruction/curriculum and local assessment?** (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

# **Statement of Enduring Knowledge**

skins, and creativity. (11	EASIL 6-	13)	
<b>Local Assessment Target</b>		Comments	
ET2.1 (9-12)			
Evaluate the design and refi	ne the design	process	
used to solve a real world pr			
E & T GSE	Curriculum/ Instruction	Local Assessment	
ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:			
1a. identifying in depth criteria and constraints by developing	0	0	
1b. evaluating and finalizing the most appropriate design solution	0	0	
1c. creating a team and assigning roles to team members	0	0	
<b>Local Assessment Target</b>			Comments
ET2.2 (9-12)			
Incorporate technological pr	roducts, syster	ms and	
their tools to achieve design	solutions.		
E & T GSE	Curriculum/ Instruction	Local Assessment	
ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:			
2a. <u>selecting independently the</u> proper tools	0	0	
2b. incorporating proper information, material selection	0	0	
2c. <u>documenting</u> , <u>communicating</u> , <u>and</u> <u>evaluating processes</u>	0	0	
2d. <u>synthesizing information to</u> develop possible solutions	0	0	

# **Question 1: Clarity of E &T GSE**

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

# **Statement of Enduring Knowledge**

skins, and creativity. (11	LIIDILO	13)			
<b>Local Assessment Target</b>	Local Assessment Target				
ET2.3 (9-12)					
Refine the processes of research	arch and deve	lopment,			
invention and innovation, ex	perimentation	ı, and			
troubleshooting for the purp	1	-			
optimal design solution.	out of manner.				
E & T GSE	Curriculum/	Local			
ET2.3 (9-12)	Instruction	Assessment			
Students demonstrate an understanding of what is an optimal					
design solution by:					
3a. formulating a process to solve a real world problem	0	0			
3b. <u>choosing appropriate materials to construct</u>	0	0			
3c. evaluating and <u>refining</u> a complex design solution	0	0			
3d. presenting <u>comparative simulations/</u> <u>prototypes and defending the selected solution.</u>	0	0			

#### **Question 1: Clarity of E &T GSE**

Is the E &T GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and local assessment? (Do I understand the expectations of student learning to implement appropriate classroom instruction/curriculum and assessment? If not, what aspect of the GSE needs further clarification? (e.g. clarify terminology, give examples, etc.)

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

\* See Introduction for Areas - medical, agricultural and biotechnologies, energy and power, information and communication, transportation, manufacturing, and construction

<b>Local Assessment Target</b>		Comments	
ET3.1 (9-12)			
Experience and implement the	he various are		
engineering and technology.			
E & T GSE	Curriculum/ Instruction	Local Assessment	
ET3.1 (9-12) Students demonstrate an understanding of the areas of engineering and technology by:	_	_	
1a. preparing a career portfolio of a	0	0	
1b. evaluating the connections within	0	0	
these areas			
<b>Local Assessment Target</b>			Comments
ET3.2 (9-12)			0 0
Evaluate the effectiveness of	tools to meas	ure.	
design, and implement speci			
E & T GSE	Curriculum/	Local	
	Instruction	Assessment	
ET3.2 (9-12) Students demonstrate an understanding of selecting appropriate tools by:			
2a. evaluating the effectiveness of	0	0	
various tool(s)	0	0	
2b. <u>developing or improving a tool</u>			

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

# **Statement of Enduring Knowledge**

ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA – STL 1-7)

•			
<b>Local Assessment Target</b>		Comments	
ET1.1 (9-12)			
Identify the factors affecting	technologica	l advances	
(e.g. social, economic, politi	cal, cultural,		
environmental) throughout h	iistory.		
ETS 1.1 (9-12) Students demonstrate	Differences	Differences	
an understanding of the influences of technology by:	Clear	Not Clear	
1a. analyzing factors related to the development	0	0	
1b. assessing the relationship between available resources	0	0	
1c. analyzing the <u>evolution of factors</u> affecting technological advances	0	0	
<b>Local Assessment Target</b>			Comments
Local Assessment Target ET1.2 (9-12)			Comments
Local Assessment Target ET1.2 (9-12) Analyze and explain advance	ements in tecl	nological	Comments
ET1.2 (9-12)		nnological	Comments
ET1.2 (9-12) Analyze and explain advance		nnological  Differences	Comments
ET1.2 (9-12) Analyze and explain advance systems and their impact on	the world.		Comments
ET1.2 (9-12) Analyze and explain advance systems and their impact on E & T GSE	the world.  Differences	Differences	Comments
ET1.2 (9-12)  Analyze and explain advance systems and their impact on E & T GSE  ETS 1.1 (9-12) Students demonstrate an understanding of the impacts of	the world.  Differences	Differences	Comments
ET1.2 (9-12)  Analyze and explain advance systems and their impact on  E & T GSE  ETS 1.1 (9-12) Students demonstrate an understanding of the impacts of technology by:  2a. revising a current technological	Differences Clear	Differences Not Clear	Comments

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

### **Statement of Enduring Knowledge**

Local Assessment Target ET2.1 (9-12)  Evaluate the design and refine the design process used to solve a real world problem.  E & T GSE ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:  1a. identifying in depth criteria and constraints by developing  1b. evaluating and finalizing the most appropriate design solution.  1c. creating a team and assigning roles to team members  Comments  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop possible solutions  Comments  Comments  Comments  Comments  Comments  Comments  Clear  October  O	skills, and creativity. (I	IEA SIL 6	13)	
used to solve a real world problem.  E & T GSE  ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:  1a. identifying in depth criteria and constraints by developing  1b. evaluating and finalizing the most appropriate design solution  1c. creating a team and assigning roles to team members  Local Assessment Target  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop			Comments	
E & T GSE  ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:  1a. identifying in depth criteria and constraints by developing  1b. evaluating and finalizing the most appropriate design solution  1c. creating a team and assigning roles to team members  Local Assessment Target  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	Evaluate the design and refi	ne the design		
ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:  1a. identifying in depth criteria and constraints by developing  1b. evaluating and finalizing the most appropriate design solution  1c. creating a team and assigning roles to team members  Clear  Clear  Not Clear  Not Clear  Comments  Comments  Comments  Comments  Comments  Comments  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	used to solve a real world p	roblem.		
ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:  1a. identifying in depth criteria and constraints by developing  1b. evaluating and finalizing the most appropriate design solution  1c. creating a team and assigning roles to team members  Local Assessment Target  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	E & T GSE			
constraints by developing  1b. evaluating and finalizing the most appropriate design solution  1c. creating a team and assigning roles to team members  Comments  ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	an understanding of the attributes of			
Local Assessment Target  ET2.2 (9-12) Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop		0	0	
1c. creating a team and assigning roles to team members  Local Assessment Target ET2.2 (9-12)  Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop				
ET2.2 (9-12) Incorporate technological products, systems and their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop		0	0	
their tools to achieve design solutions.  E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	ET2.2 (9-12)			Comments
E & T GSE  ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop		•	ns ana	
an understanding of technological products and systems by:  2a. selecting independently the proper tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	E & T GSE	Differences		
tools  2b. incorporating proper information, material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop	an understanding of technological			
material selection  2c. documenting, communicating, and evaluating processes  2d. synthesizing information to develop		0	0	
evaluating processes  2d. synthesizing information to develop		0	0	
2d. syndicisizing information to develop		0	0	
		0	0	

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

### **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>			Comments
ET2.3 (9-12)			
Refine the processes of resec	arch and deve	lopment,	
invention and innovation, ex	perimentation	ı, and	
troubleshooting for the purp	ose of achievi	ing an	
optimal design solution.			
E & T GSE	Differences	Differences	
ET2.3 (9-12) Students demonstrate	Clear	Not Clear	
an understanding of what is an			
optimal design solution by:			
3a. formulating a process to solve a real world problem	0	0	
3b. choosing appropriate materials to construct	0	0	
3c. evaluating and <u>refining</u> a complex	0	0	
design solution  3d. presenting comparative simulations/	0	0	
prototypes and defending the selected			
solution.			

Are the differences between the E & T GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This suggests that the same content addressed in later grades should be of developmentally appropriate increased difficulty or depth.

#### **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

\* See Introduction for Areas - medical, agricultural and biotechnologies, energy and power, information and communication, transportation, manufacturing, and construction

<b>Local Assessment Target</b>			Comments
ET3.1 (9-12)			
Experience and implement the	he various are	eas in	
engineering and technology.			
E & T GSE ET3.1 (9-12) Students demonstrate	Differences Clear	Differences Not Clear	
an understanding of the areas of engineering and technology by:			
1a. preparing a career portfolio of a	0	0	
1b. evaluating the connections within	0	0	
these areas			
Local Assessment Target			Comments
ET3.2 (9-12)			Comments
Evaluate the effectiveness of	tools to meas	ure,	
design, and implement speci			
E & T GSE	Differences Clear	Differences Not Clear	
ET3.2 (9-12) S tudents demonstrate an understanding of selecting appropriate tools by:	Cicui	110t Olcui	
2a. evaluating the effectiveness of	0	0	
various tool(s)  2b. developing or improving a tool	0	0	

Question 3: Expected Rigors Is the GSE more rigorous, school's engineering and to	similar t			us than what is presently expected in your ills at that grade span?
Statement of Enduring Kn ET1 - Engineering and (ITEA – STL 1-7)	_		pacts the	e world and the growth of humankind
Local Assessment Target ET1.1 (9-12) Identify the factors affecting (e.g. social, economic, politic environmental) throughout if	ical, culti	0	vances	Comments
E & T GSE ET1.1 (9-12) Students demonstrate an understanding of the influences of technology by:	More Rigorous	As Rigorous	Less Rigorous	
1a. analyzing factors related to the development	0	0	0	
1b. <u>assessing the relationship between</u> available resources	0	0	0	
1c. analyzing the <u>evolution of factors</u> <u>affecting technological advances</u>	0	0	0	
Local Assessment Target ET1.2 (9-12) Analyze and explain advanc systems and their impact on			ogical	Comments
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET1.2 (9-12) Students demonstrate an understanding of the impacts of technology by:				
2a. revising a current technological system and analyzing the global	0	0	0	
2b. modeling and evaluating the design of a technological system	0	0	0	

Question 3: Expected Rigo Is the GSE more rigorous, school's engineering and to	similar t			us than what is presently expected in your ills at that grade span?
Statement of Enduring Kn	owledge			
ET2 - Effective design	through	engine	ering ar	d technology is the outcome of a
problem solving process	involvi	ing the	applicat	ion of content knowledge, acquired
skills, and creativity. (IT	EA ST	L 8-13)		
Local Assessment Target				Comments
ET2.1 (9-12)				<u> </u>
Evaluate the design and refi	ne the de	sign proc	cess	
used to solve a real world pr	roblem.			
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:				
1a. identifying in depth criteria and constraints by developing	0	0	0	
1b. evaluating and finalizing the most appropriate design solution	0	0	0	
1c. creating a team and assigning roles to team members	0	0	0	
Local Assessment Target ET2.2 (9-12) Incorporate technological p		•	ınd	Comments
their tools to achieve design				
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET2.2 (9-12) Students demonstrate an understanding of technological products and systems by:				
2a. <u>selecting independently the</u> proper tools	0	0	0	
2b. incorporating proper information, material selection	0	0	0	
2c. documenting, communicating, and evaluating processes	0	0	0	
2d. <u>synthesizing information to</u> develop possible solutions	0	0	0	

# **Question 3: Expected Rigor**

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

# **Statement of Enduring Knowledge**

skills, allu cleativity. (11	LASII	L 0-13)		
<b>Local Assessment Target</b>		Comments		
ET2.3 (9-12)				
Refine the processes of research	arch and	developn	nent,	
invention and innovation, ex	periment	ation, an	d	
troubleshooting for the purp	ose of ac	hieving a	ın	
optimal design solution.	v	O		
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET2.3 (9-12) Students demonstrate an understanding of what is an				
optimal design solution by:				
3a. formulating a process to solve a real world problem	0	0	0	
3b. <u>choosing appropriate materials to construct</u>	0	0	0	
3c. evaluating and <u>refining</u> a complex design solution	0	0	0	
3d. presenting <u>comparative simulations/</u> <u>prototypes and defending the selected solution.</u>	0	0	0	

# **Question 3: Expected Rigor**

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's engineering and technology content and skills at that grade span?

# **Statement of Enduring Knowledge**

ET3 - The designed world community selects and uses the appropriate technology. (ITEA – STL 14-20)

\* See Introduction for Areas - medical, agricultural and biotechnologies, energy and power, information and communication, transportation, manufacturing, and construction

Local Assessment Target ET3.1 (9-12) Experience and implement the engineering and technology.	he variou	Î		Comments
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET3.1 (9-12) Students demonstrate an understanding of the areas of engineering and technology by:				
1a. preparing a career portfolio of a	0	0	0	
1b. evaluating the connections within these areas	0	0	0	
<b>Local Assessment Target</b>				Comments
ET3.2 (9-12)				
Evaluate the effectiveness of	tools to	measure,		
design, and implement speci		ologies.		
E & T GSE	More Rigorous	As Rigorous	Less Rigorous	
ET3.2 (9-12) Students demonstrate an understanding of selecting appropriate tools by:				
2a. evaluating the effectiveness of various tool(s)	0	0	0	
2b. developing or improving a tool	0	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set No o Yes o **Statement of Enduring Knowledge** ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA – STL 1-7) **Local Assessment Target Comments** ET1.1 (9-12) Identify the factors affecting technological advances (e.g. social, economic, political, cultural, environmental) throughout history. Individual coherence within the E & T GSE **Statement of Enduring** Knowledge ET1.1 (9-12) Students demonstrate an understanding of the influences of no yes technology by: 1a. analyzing factors related to the 0 0 development... 1b. assessing the relationship between available resources ... 1c. analyzing the evolution of factors 0 $\circ$ affecting technological advances .... **Local Assessment Target** Comments ET1.2 (9-12) Analyze and explain advancements in technological systems and their impact on the world. Individual coherence within the E & T GSE **Statement of Enduring** ET1.2 (9-12) Students demonstrate Knowledge an understanding of the impacts of yes no technology by: 0 2a. revising a current technological 0 system and analyzing .... 0 0 2b. modeling and evaluating the design of a technological system ...

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

#### **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>			Comments
ET2.1 (9-12)			
Evaluate the design and ref	_	n process	
used to solve a real world p	roblem.		
E & T GSE	& T GSE  Individual coherence with Statement of Enduring		
ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process by:	yes	no	
1a. identifying in depth criteria and constraints by developing	0	0	
1b. evaluating and finalizing the most appropriate design solution	0	0	
1c. creating a team and assigning roles to team members	0	0	
Local Assessment Target		ı	Comments
ET2.2 (9-12)			
Incorporate technological p	•	ems ana	
their tools to achieve design	I SOULLOUS. Individual coher	rongo within the	
E & T GSE ET2.2 (9-12) Students demonstrate	Statement of En Knowledge		
an understanding of technological products and systems by:	yes	no	
2a. <u>selecting independently the</u> proper tools	0	0	
2b. incorporating proper information, material selection	0	0	
2c. documenting, communicating, and evaluating processes	0	0	
2d. <u>synthesizing information to</u> develop possible solutions	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

#### GSEs for this EK Statement coherent as a set

Yes o

No o

# **Statement of Enduring Knowledge**

<b>Local Assessment Target</b>			Comments
ET2.3 (9-12)			
Refine the processes of rese	arch and dev		
invention and innovation, ex	xperimentation in the contraction in the contractio		
troubleshooting for the purp	ose of achie		
optimal design solution.	Ū		
E & T GSE ET2.3 (9-12) Students demonstrate	Individual coher Statement of En Knowledge		
an understanding of what is an optimal design solution by:	yes	no	
3a. formulating a process to solve a real world problem	0	0	
3b. choosing appropriate materials to construct	0	0	
3c. evaluating and <u>refining</u> a complex design solution	0	0	
3d. presenting <u>comparative simulations/</u> <u>prototypes and defending the selected solution.</u>	0	0	

Go back and review ALL the E & T GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

**Statement of Enduring Knowledge** 

GSEs for this EK Statement coherent as a set

ET3 - The designed world community selects and uses the appropriate technology.

No o

#### (ITEA – STL 14-20) \* See Introduction for Areas - medical, agricultural and biotechnologies, energy and power, information and communication, transportation, manufacturing, and construction **Local Assessment Target Comments** ET3.1 (9-12) Experience and implement the various areas in engineering and technology. Individual coherence within the E & T GSE Statement of Enduring ET3.1 (9-12) Students demonstrate Knowledge an understanding of the areas of yes no engineering and technology by: 0 1a. preparing a career portfolio of a ... 1b. evaluating the connections within 0 $\circ$ these areas ... **Local Assessment Target Comments** ET3.2 (9-12) Evaluate the effectiveness of tools to measure, design, and implement specific technologies. Individual coherence within the E & T GSE **Statement of Enduring** Knowledge ET3.2 (9-12) Students demonstrate an understanding of selecting yes no appropriate tools by: 2a. evaluating the effectiveness of various tool(s) ... $\circ$ 2b. developing or improving a tool ...

Relevant EK and SSEs dentify by EK and GSE umber - ex. E&T 1, 1a)	Content/Concepts/Skills that need to be included (Please provide as much detail as possible)

### **Appendix**

The Rhode Island K-12 Grade Span Expectations in Engineering and Technology is a companion to the Rhode Island K-12 Grade Span Expectations in Science. As a total document, the Rhode Island K-12 Grade Span Expectations in Science, Engineering and Technology offer districts and schools clear images of the developmentally appropriate content and skills students should acquire by studying the natural world (earth and space science, life science, physical science) and the designed world (engineering and technology). By addressing both knowledge and application, together they help build the science literacy that is so critical for life in the 21<sup>st</sup> century. The Rhode Island K-12 Grade Span Expectations in Science, Engineering and Technology were developed and reviewed by Rhode Island teachers. The work in science was done in 2005 and the work in engineering and technology was done in 2006.

The Grade Span Expectations (GSEs) in Science are derived from the Assessment Targets developed for the state assessment in science through the New England Common Assessment Program (NECAP). By meeting these science GSEs, students should be well-prepared for the NECAP Science Assessment beginning operationally in Spring 2008 in Grades 4, 8 and 11.

The Grade Span Expectations in Engineering and Technology are for the purposes of local assessment. The Rhode Island High School Diploma System requires that students demonstrate proficiency in technology. The engineering and technology GSEs provide guidance to districts and schools as to these proficiencies.

The format of the *Rhode Island K-12 Grade Span Expectations in Science, Engineering and Technology* is such that the GSEs are specific derivations of broad assessment targets which, in turn, are extractions from even broader Statements of Enduring Knowledge. Stems link the targets to the expectations. See the next page for the Hierarchy Rhode Island of the K-12 Grade Span Expectations in Science, Engineering and Technology

The Statements of Enduring Knowledge:

- identify (or state) the fundamental knowledge/concepts of the domains
- cut across grade levels (learning is developmental/built upon over time)
- are of comparable grain size (larger than grain size of a single grade expectation)
- encompass, as a set, the essential learning for each domain
- imply topics of study (lead to focused instruction as identified in science, engineering and technology standards/benchmarks

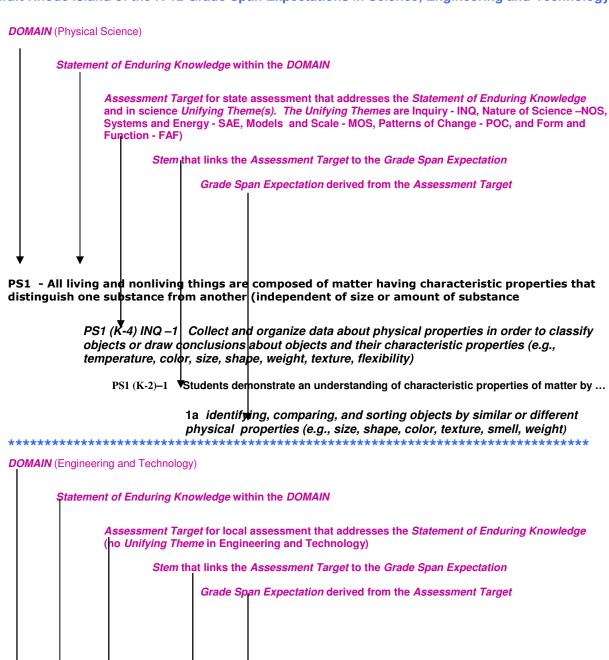
#### The Assessment Targets:

- delineate the content and skills that is encompassed by the Statements of Enduring Knowledge
- are derived from/aligned with national and/or state science, engineering and technology standards
- specify the eligible content or fair game for state and local assessment in science and local assessment in engineering and technology

The K-12 Grade Span Expectations in Science, Engineering and Technology:

- are derived from/aligned with the state (science) and local (engineering and technology) assessment targets
- are written for grade spans K-2,3-4,5-6,7-8 and 9-11 in science because the NECAP Science Assessment is at the end of Grade 11
- are written for grade spans and for K-2,3-4,5-6,7-8 and 9-12 in engineering and technology

# Hierarchy draft Rhode Island of the K-12 Grade Span Expectations in Science, Engineering and Technology



ET1 - Engineering and technology impacts the world and the growth of humankind (ITEA - STL 1-7)

ET1.1 (K -4) Demonstrate and identify reasons for the development of technology and its

effects on humankind

ET1.1 (K-2) Students demonstrate an understanding of the nature of technology by...

1a. investigating life without current technology (e.g. role-play use of the bucket brigade instead of a fire truck).